

DETAILED ACTION

1. This is the initial Office Action based on the 10/584,945 application filed 6/5/2006. Claims 1-12, as originally filed, are currently pending and have been considered below.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Interview Summary

3. On 6/10/2009, after getting approval from his supervisor, the examiner called the attorney for the applicant, Dennis Chen (Reg. # 61767), to discuss potential amendments to correct minor issues in the claims, as well as to overcome a rejection of claims 7-12 under U.S.C. 101. The reasons for the potential amendments are to

- a. Correct mentions of "said mean value calculating [means or step]" to "said [first or second] mean value calculating [means or step]"
- b. Remove unnecessary parentheses that make the scope of the claims indefinite
- c. Remove second references to claim terms that make the claims unclear, such as for example "a first plurality of pixels (referred to below as 'first neighboring pixels')"

- d. Tie the methods of claims 7-12 to a particular apparatus so as to avoid a rejection under U.S.C. 101
- e. Correct a minor discrepancy in Figure 11

The attorney for the applicant believed the proposed changes to the method claims 7-12 were unnecessary in view of U.S.C. 101 and therefore did not want to make the proposed changes to these claims without having a chance to argue the rejections in view of U.S.C. 101. The examiner faxed a copy of the proposed amendments to the attorney for the applicant for reference purposes.

Drawings

4. The drawings are objected to because of a minor discrepancy in Fig. 11. Namely, an incorrect line from latch 33b to summation node 36a should be deleted. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application

must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 1, 2, 7, and 8 are objected to because of the following informalities: claim terms are given second names in the clauses in the parentheses. This is ambiguous. The examiner recommends making the following changes:

6. Claims 1, 2, 7, and 8: "...a **first** plurality of first neighboring pixels (~~referred to below as 'first neighboring pixels'~~) having the h-th spectral sensitivity characteristic, disposed in a neighborhood of the pixel position of interest, decides whether an absolute value of a first difference between its signal value and the signal value of the pixel signal of the h-th spectral sensitivity characteristic at the pixel position of interest (~~referred to below as a 'first difference'~~) is larger than..."

7. Claims 1, 2, 7, and 8: "...a **second** plurality of second neighboring pixels (~~referred to below as 'second neighboring pixels'~~) having the k-th spectral sensitivity characteristic, disposed in a neighborhood of the pixel position of interest, decides whether an absolute value of a second difference between its signal value and a mean value of the signals of a plurality of pixels of the k-th spectral sensitivity characteristic adjacent to the pixel position of interest (~~referred to below as a 'second difference'~~) is larger than..."

8. Appropriate correction is required.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1, 2, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite the phrase "... (h and k being different integers between 1 and N, inclusive)..." The parentheses make the claims indefinite because it is not clear whether the limitation within the parentheses is required by the claims. The parentheses should be deleted.

11. Claims 1, 2, 7, and 8 recite the limitation "'said mean value calculating [means or step]" (two instances in each claim). There is insufficient antecedent basis for this limitation in the claim. The claim language should be changed to "said [first or second] mean value calculating [means or step]".

12. Claims 1, 2, 7, and 8 recite the limitation "the [h-th or k-th] pixel signal at the pixel position of interest" (two instances in each claim). There is insufficient antecedent basis for this limitation in the claim. The claim language should be changed to "the pixel signal of the [h-th or k-th] spectral sensitivity characteristic at the pixel position of interest".

13. Claims 4, 6, 10, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. The claims recite the phrase "... wherein in calculating the mean value of the plurality of pixel signal values selected by the first comparison and selection [means or step], each of the first and second mean value calculating [means or steps] calculates a weighted mean, ...". However, the second mean value calculating [means or step] operates on the output of the second comparison and selection [means or step]. Therefore, the meaning of the claim is unclear. In the examiner's opinion, the claims should be changed to "... wherein in calculating the mean value of the plurality of pixel signal values selected by the first comparison and selection [means or step] and the second comparison and selection [means or step], each of the first and second mean value calculating [means or steps] calculates a weighted mean, ..."

Claim Rejections - 35 USC § 101

14. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

15. Claims 7-12 are rejected under 35 U. S. C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 7-12 define process claims. Based on Supreme Court precedent and recent Federal Circuit decisions (*Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584-588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-

88 (1876)), a process that is statutory under U.S.C. 101 requires that the process must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. To qualify as a statutory process, the claim should positively recite the other statutory class (the thing or product) to which it is tied, for example by identifying the apparatus that accomplishes the method steps, or positively recite the subject matter that is being transformed, for example by identifying the material that is being changed to a different state.

(See also *In re Bilski*, 545 F.3d 943, 88 U.S.P.Q.2d 1385 (Fed. Cir. 2008): "A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. See *Benson*, 409 U.S. at 70 ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."); *Diehr*, 450 U.S. at 192 (holding that use of mathematical formula in process "transforming or reducing an article to a different state or thing" constitutes patent-eligible subject matter); see also *Flook*, 437 U.S. at 589 n.9 ("An argument can be made [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a 'different state or thing'"); *Cochrane v. Deener*, 94 U.S. 780, 788 (1876) ("A process is . . . an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.") " ... we ...

reaffirm that the machine-or-transformation test, properly applied, is the governing test for determining patent eligibility of a process under § 101.”)

Claims 7-12 define processes, wherein additional data is generated from source data. As stated above, to qualify as a statutory process under U.S.C. 101, a process claim should either (1) be tied to another statutory class (i.e. machine, manufacture, or composition of matter), which in this case the claims are not, or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. In this case, the processes do not transform underlying subject matter, abstract data, to a different state or thing. Rather, the processes generate additional data from the original data. That is, source data are shown in Figs. 3-5, from this data, additional data are generated as shown in Figs. 6-8, and from the source data and the additional data, a third data set is generated. The original data is not transformed to a different state because the original data still exists, see Fig. 1 elements 6r to 6g. Further, even if one could say that the original data set was transformed into the third data set, both sets of data are still abstract data. If the claimed process inputs abstract data, and the result of the claimed process is abstract data, then the claimed process has not transformed the underlying subject matter, abstract data, to a different state or thing.

An example of a method claim that would not qualify as a statutory process would be a claim that recited purely mental steps. In this case, the process steps can be purely mental steps because the processes describe purely mathematical and logical steps that can be performed by a person on paper. Therefore, the examiner concludes that the processes are not statutory eligible processes under U.S.C. 101. “... mental

processes and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." Benson, 409 U.S. at 67; see also Comiskey, 499 F.3d at 1378-79 (holding that "mental processes," "processes of human thinking," and "systems that depend for their operation on human intelligence alone" are not patent-eligible subject matter under Benson).

Further, even assuming for the sake of argument that the claimed methods passed the "machine-or-transformation" test for patent eligibility, in the examiner's opinion, the claims would still fail to qualify for eligibility because they do not represent a practical application of an abstract idea. The claimed subject matter relates to the manipulation and generation of data, which is an abstract idea, one of the 35 U.S.C. 101 Judicial Exceptions. In order to be eligible for patent protection, the claim must therefore be for a practical application of the abstract idea. A claimed invention is directed to a practical application of a 35 U.S.C. 101 judicial exception when it: (A) "transforms" an article or physical object to a different state or thing; or (B) otherwise produces a useful, concrete and tangible result. Clearly, the claims do not satisfy (A). Regarding (B), see MPEP 2106 which states: "... the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world result." In this case, the methods define processes where the result is that a third data set is generated. The third data set cannot be a tangible result because the third data set is not even output, nor do the claims even recite that the data being

modified is image data. That is, the process steps are purely abstract mathematical and logical steps involving manipulations of abstract data.

Allowable Subject Matter

16. Claims 1-6 would be allowable if the issues regarding the objections and rejections under U.S.C. 112 as explained above are resolved. Further, if claims 7-12 are amended to overcome the rejections under U.S.C. 101, and also the objections and rejections under U.S.C. 112 as explained above, claims 7-12 would also be allowable.

17. The following is a statement of reasons for the indication of allowable subject matter: the cited art of record does not teach a pixel signal processing apparatus for generating a pixel signal having a k-th spectral sensitivity characteristic at a pixel position of interest where there is a pixel signal having an h-th spectral sensitivity characteristic in a group of pixel signals from pixels arrayed on a two-dimensional plane, each pixel having one of a first to an N-th spectral sensitivity characteristic, h and k being different integers between 1 and N, inclusive, the pixel signal processing apparatus comprising:

a first comparison and selection means that, for each of a plurality of first neighboring pixels having the h-th spectral sensitivity characteristic, disposed in a neighborhood of the pixel position of interest, decides whether an absolute value of a first difference between its signal value and the signal value of the pixel signal of the h-th spectral sensitivity characteristic at the pixel position of interest is larger than a predetermined first threshold value, selects the signal value of the pixel signal of the h-

th spectral sensitivity characteristic at the pixel position of interest if the absolute value of the first difference is larger than the first threshold value, and selects the signal value of the first neighboring pixel if the absolute value of the first difference is smaller than the first threshold value; and

a second comparison and selection means that, for each of a plurality of second neighboring pixels having the k-th spectral sensitivity characteristic, disposed in a neighborhood of the pixel position of interest, decides whether an absolute value of a second difference between its signal value and a mean value of the signals of a plurality of pixels of the k-th spectral sensitivity characteristic adjacent to the pixel position of interest is larger than a predetermined second threshold value, selects said mean value of the signals of said plurality of pixels of the k-th spectral sensitivity characteristic if the absolute value of the second difference is greater than the second threshold value, and selects the signal value of the second neighboring pixel if the absolute value of the second difference is less than the second threshold value, in conjunction with the other limitations of the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Okisu (US Patent 6,091,862) teaches a mosaic image data interpolation scheme wherein red and blue components are interpolated taking the green components into consideration.

Tsuruoka et al. (US Patent 6,721,003) teach a mosaic image data interpolation scheme.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS HOGUE whose telephone number is (571) 270-5089. The examiner can normally be reached on Mon. - Thurs., 8:00 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin Ye/

Supervisory Patent Examiner, Art Unit 2622

DH

Examiner

6/10/2009